

## SAFETY WINGED NEEDLE MEDICAL DEVICES

This application is a continuation-in-part of U.S. patent application Ser. Nos. 162,569 and 224,920, respectively filed Mar. 1, 1988 and July 27, 1988, now U.S. Pat. Nos. 5,059,185 and 4,923,445, respectively, which are hereby incorporated by reference herein.

## BACKGROUND OF THE INVENTION

The present invention generally relates to winged needle medical devices. More particularly, the present invention relates to safety winged needle medical devices such as winged blood collection needles, winged infusion needles, and blood collection bags with attached winged needles, which are designed to minimize the incidence of accidental needlesticks after needle contamination.

Accidental needlesticks have long been a problem in the medical profession. Accidental needlesticks most often occur during the recapping of a contaminated needle or immediately after use and prior to safe disposal. Such needlesticks place the medical professional (clinician) at risk. When needles are not recapped, additional accidental needlesticks are caused by uncapped needles found in patient beds, linens, and in garbage cans, and place health care, housekeeping and sanitation personnel at risk. Because accidental needlesticks can now result in deadly incurable diseases as well as the previously appreciated serious, but curable diseases, the need for eliminating the needlestick problem has reached extreme urgency. In addressing the urgency, many devices have been proposed. Indeed, reference may be had to the background section of parent application hereof, U.S. patent application Ser. No. 162,569 for a discussion of the prior art of safety needles.

While numerous safety needles of varying complexity and feasibility have been proposed, fewer safety devices for winged needle arrangements have been proposed; perhaps due to the more flexible nature of typical winged needle devices. One proposed safety winged needle device is the retractable safety winged needle of Jagger et al., U.S. Pat. No. 4,676,783. As seen in FIG. 1, herein, the Jagger et al. device includes an outer shield 10, an inner tube 20, a needle 30, wings 50, and tabs 52. The outer shield 10 which has wings 50 attached to it has inner camming surfaces 28 which act as a restriction on one end and a constriction 16 on the needle end. The needle 30 is attached to an enlarged end 22 of the inner tube 20, the other end of which has the tabs 52 attached to it. The device is used by holding the wings 50 while pushing the needle 30 into a vein. Upon removing the needle from the vein, the practitioner pulls back on the tabs 52 attached to the inner tube while holding the wings 50 attached to the outer tube in place. As a result, the inner tube 20 slides backward inside the outer tube 10 until the enlarged end of the inner tube 20 is caught in the inner camming surface 28 of the outer tube 10. At that point, the needle 30 is safely covered by the outer tube 10, and with the inner and outer tubes wedged together, the assembly may be safely disposed.

While the Jagger et al. device is attractive in its simplicity, it apparently has not gained acceptance in the marketplace because it does not provide means to lock or secure the needle and hold it in place during venipuncture. Moreover, it is very difficult to manufacture and assemble. In manufacturing, the enlarged end 22 of the inner tube must eventually be received inside the

outer tube 10. However, the camming surfaces 28 of the outer tube 10 prevent such insertion.

## SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide improved winged needle safety devices which are easy and economical to manufacture and assemble.

It is a further object of the invention to provide winged needle safety shielded devices which do not require a substantial change of technique and procedure during use and which utilize a standardized locking mechanism in which the movement of a shield from an unshielded position to a locked shielded position may be accomplished in any easy uniform sliding motion.

In accord, with the objects of the invention, a safety shielded winged needle assembly for blood collection and intravenous infusion is provided and is comprised of two cooperating pieces. A first piece is a hollow inner tube needle adaptor having a front end adapted to have a hollow needle secured thereto and a rear end adapted to have flexible tubing secured thereto. The outer surface of the inner tube member (hereinafter referred to as the "tube" or the "inner tube" member) is configured with a pair of axially spaced circumferential grooves with one of the grooves preferably being formed towards the rearmost end of the tube and the other of the grooves preferably being near the forward end of the tube. The second piece of the safety shielded winged needle assembly is a winged outer safety shield (hereinafter referred to as the "shield", "winged shield" or "outer shield"). The outer shield carries the wings of the device. The outer shield is of slightly larger cross-section than the inner tube and during assembly is slidable over the tube. One end of the outer shield has at least one inwardly extending protrusion such that the end may take any of the forms shown in parent U.S. patent application Ser. No. 224,920.

Prior to use of the safety winged needle assembly, the inward protrusions of the shield yieldingly engage the rearmost groove of the inner tube thereby allowing the needle to be exposed and permitting normal use of the winged needle device. Thereafter, the needle may be withdrawn from the vein by sliding the inner tube backwards relative to the shield with the shield in place. In moving the inner tube relative to the outer shield, the shield's protrusion disengages from the rearmost groove and slides along the inner tube until a protrusion engages the forward groove. In such a position, the shield extends over the needle and prevents accidental contact with the contaminated needle. Rotation of the outer tube relative to the inner tube when the shield is in its retracted position and the needle is exposed is eliminated by any of several means. Interlocking ratchet means on the outside of the inner tube and the inside of the outer tube and/or rear locking wings on the inner tube which can engage the coaxial slits in the rear of the outer shield may be provided to eliminate relative rotation. Alternatively, the shield and the inner tube may be shaped as semicircles, half ovals, or other non-circular shapes to prevent rotation.

A better understanding of the safety winged needle medical assembly of the invention, and additional advantages and objects of the invention will become apparent to those skilled in the art upon reference to the detailed description and accompanying drawings.